



State of Utah

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DIVISION OF ENVIRONMENTAL HEALTH

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APR 29 1991

DIVISION OF
OIL GAS & MINING

April 26, 1991

Mr. Frank Wicks
Vice President & General Manager
Barrick Mercur Gold Mine
P.O. Box 838
Tooele, Utah 84074

RE: March 11, 1991 Dump 3 Report of Flow in
Upper Leak Detection System, Notice of
Intent to Modify Ground Water Quality
Discharge Permit No. UGW450001.

Dear Mr. Wicks:

We have held discussions with your staff in a meeting on March 12, 1991 regarding the appearance of fluid in the leak detection system and have reviewed the report, referenced above.

Based on this information we are unable to agree with your conclusion that the discharge from the upper leak detection system was exclusively from the release of water trapped in the system during construction. As of this date we have made the following determinations:

1. When the clay middle liner was excavated to connect the upper leak detection channel or "burrito" to the vertical riser pipe, Barrick staff found the burrito was not completely saturated, and observed water discharged from the burrito to the riser at a rate of less than three gallons per minute.
2. Installation of the upper FML was completed by October 9, 1991. The drainage pipe which conveys leakage fluids from the burrito was open to allow free drainage before October 9, 1990 through the date of start-up on December 19, 1990.
3. Flow capacity of the burrito's drainage pipe at approximately 400 gpm is much greater than the flow capacity of the burrito (Water Balance and Head Control Plan, February 19, 1991, p.6).

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4. Freezing conditions for low-volume, low-velocity flows in near surface pipes did not exist until after mid-December, 1990. Therefore, more than 60 days were available for the burrito to drain under the influence of gravity before start-up of leaching on December 19, 1990.
5. The burrito was constructed of washed pea gravel with an approximate diameter of 0.25 inch. Such a material has an approximate permeability on the order of 1 cm/sec. Based on such a high permeability it is reasonable to expect that 60 days would be sufficient time to drain a fully saturated burrito, which is conservative, even under decaying head conditions.
6. Free cyanide content of the discharged fluids was initially undetectable during the period of highest flow rate from the system, February 1-5, 1991, after ignoring three conflicting analyses of February 4, 1991 (free cyanide analysis, mg/l: Barrick 0.0, Chemtech 1.84, Datachem 0.49). Free cyanide content then increased to approximately 0.5 mg/l by February 13, 1991 where it appears to have stabilized through the period including April 7, 1991.
7. Leach tests conducted on two samples of the Long Trail Shale are not conclusive, in that only one in five separate water samples showed any free cyanide content. Two of the four water samples decanted and analyzed by Barrick's uncertified on-site laboratory at 72 and 168 hours into the test showed no free cyanide (0 mg/l, no analysis was made on a third sample, taken at 96 hours). The fourth water sample, pressure filtered by Barrick after 168 hours and analyzed by Chemtech, showed 0.594 mg/l free cyanide. It is unclear how pressure filtering could account for the increased cyanide content of the Chemtech sample, considering the diffusion of the cyanide and the fact that both waters had the same contact time with the shale. The 168 hour Barrick and Chemtech analyses are also inconsistent in that Barrick's on-site lab has detected free cyanide concentrations on other water samples as low as 0.332 mg/l, yet for this sample the 0.594 mg/l content was below the on-site lab's detection capacity. In a separate test where Chemtech both leached the shale (24 hours) and analyzed the water sample, the test showed no free cyanide content. In addition, very little detailed information has been provided which would allow us to fully evaluate the tests, including the mass of shale leached, pH and volume of water used, temperature and degree of sample agitation during the test, filtration of water samples upon extraction, etc.

Based on these points we have determined it is necessary to conduct additional monitoring in order to fully evaluate the discharge from the upper leak detection system. In order to properly administer this additional monitoring, the Executive Secretary has determined it necessary to modify the existing Ground Water Discharge Permit. This letter constitutes a Notice of Intent to modify your existing permit. A copy of the draft changes is enclosed for your review.

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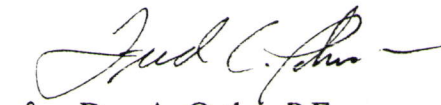
The permit changes are minor in nature because the upper leak collection system was identified as a point of monitoring in the original permit [Part I E 7(c)], and because the changes only constitute an increase in the frequency of sample collection and analysis.

Please review the proposed changes and feel free to contact our staff if you have any questions or comments. We propose to make these permit changes final in approximately ten (10) days after your receipt of this letter, unless we receive substantive comments.

The attached changes also include several other minor revisions instated for the purpose of updating the permit. We appreciate your continued cooperation.

Sincerely,

Utah Water Pollution Control Committee


for Don A. Ostler, P.E.
Executive Secretary

enclosure

cc: George Condrat, Dames & Moore
Wayne Hedberg, DOGM
Myron Bateman, Tooele County Health Dept.

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